

IN THE CLAIMS

Please cancel claim 2 without prejudice or disclaimer, amend claims 1, 3, 10, 11 and 17, and add claims 21 thru 23, as follows:

1 1. (Currently Amended) A photographing apparatus having a function of
2 preventing a blur of a still image, the apparatus comprising:

3 a photoelectric transduction unit for photoelectrical-transducing incident light
4 from a lens;

5 a pulse generation unit for outputting a charge extract pulse for extracting charge
6 accumulated in the photoelectric transduction unit, and an erase pulse for erasing the
7 accumulated charge;

8 a diaphragm unit for controlling an amount of light incident on the photoelectric
9 transduction unit;

10 a diaphragm driving unit for controlling an open/close operation of the diaphragm
11 unit; and

12 a control unit for outputting, to the diaphragm driving unit, a first control signal to
13 supply a driving voltage in a direction of opening the diaphragm unit, for outputting, to
14 the diaphragm driving unit, a second control signal to supply the driving voltage in a
15 direction of closing the diaphragm unit, and for controlling the operation of the
16 photoelectric transduction unit, the pulse generation unit, and the diaphragm driving unit;

17 wherein the diaphragm driving unit comprises:

18 a diaphragm motor for opening and closing the diaphragm unit by imparting
19 a rotational movement generated by a magnetic field to the diaphragm unit; and
20 a diaphragm motor driving unit for controlling a direction of rotation and a
21 speed of the diaphragm motor; and
22 wherein the diaphragm motor comprises:
23 a rotor connected to the diaphragm unit, and rotated in at least one of a
24 forward direction and a backward direction under control of the diaphragm motor
25 driving unit;
26 an elastic member having one end connected to a fixed point and another
27 end connected to the rotor for rotating the rotor in a direction for closing the
28 diaphragm unit;
29 a driving coil for generating a magnetic field to cause a rotational
30 movement of the rotor in at least one of a direction for opening and a direction for
31 closing the diaphragm unit; and
32 damping means for preventing damping of the rotor.

Claim 2. (Canceled)

1 3. (Currently Amended) The apparatus according to claim [[2]] 1, wherein the
2 ~~diaphragm motor comprises:~~
3 ~~a rotor connected to the diaphragm unit, and rotated in at least one of a forward~~

4 ~~direction and a backward direction under control of the diaphragm motor driving unit,~~
5 ~~an elastic member having one end connected to a fixed point and another end~~
6 ~~connected to the rotor for rotating the rotor in a direction for closing the diaphragm unit,~~
7 ~~a driving coil for generating a magnetic field to cause a rotational movement of the~~
8 ~~rotor in at least one of a direction for opening and a direction for closing the diaphragm~~
9 ~~unit; and~~

10 damping means, ~~including~~ includes a damping coil, a switch connected to said
11 damping coil, and a damping resistance connected to said switch; ~~for preventing damping~~
12 ~~of the rotor.~~

1 4. (Original) The apparatus according to claim 3, wherein the diaphragm motor
2 driving unit comprises:

3 an input voltage terminal unit having one end for receiving a reference potential
4 signal and another end for receiving a diaphragm control signal; and

5 a voltage conversion unit for converting an input voltage from the input voltage
6 terminal unit into a driving voltage of the diaphragm motor;

7 wherein the control unit outputs the first control signal for varying the diaphragm
8 control signal to form the driving voltage in the driving coil in a direction for closing the
9 diaphragm unit, and outputs the second control signal for opening the switch of the
10 damping means when closing the diaphragm unit.

1 5. (Original) The apparatus according to claim 4, wherein the varied diaphragm
2 control signal is supplied until the operation of extracting the charge accumulated in the
3 photoelectric transduction unit is completed according to the charge extract pulse from
4 the pulse generation unit.

1 6. (Original) The apparatus according to claim 4, wherein the varied diaphragm
2 control signal causes an initial value of the driving voltage to be higher than a final value
3 of the driving voltage for a predetermined period of time after a start time of the close
4 operation of the diaphragm unit.

1 7. (Original) The apparatus according to claim 3, wherein the diaphragm motor
2 driving unit comprises:

3 an input voltage terminal unit having one end for receiving a reference potential
4 signal and another end for receiving a diaphragm control signal;

5 a voltage conversion unit for converting an input voltage from the input voltage
6 terminal unit into a driving voltage of the diaphragm motor; and

7 a switch unit for varying a voltage supplied from the voltage conversion unit to the
8 diaphragm motor according to a short operation, and for supplying the driving voltage to
9 the diaphragm motor to alternately open and close the diaphragm unit;

10 wherein the control unit outputs a switching control signal to the switch unit,
11 thereby outputting a control signal for supplying, to the diaphragm unit, the driving

12 voltage for closing the diaphragm unit by inverting the driving voltage supplied to the
13 diaphragm motor in opening the diaphragm unit when closing the diaphragm unit, and for
14 outputting a control signal for opening the switch connected to the damping coil when
15 supplying the driving voltage to close the diaphragm unit.

1 8. (Original) The apparatus according to claim 7, wherein the driving voltage for
2 closing the diaphragm unit is supplied until the operation of extracting the charge
3 accumulated in the photoelectric transduction unit is completed according to the charge
4 extract pulse from the pulse generation unit.

1 9. (Original) The apparatus according to claim 8, wherein the driving voltage
2 has an initial value higher than a final value, and is a step signal which maintains the
3 initial value for a predetermined period of time.

1 10. (Currently Amended) ~~[[The]]~~ A photographing apparatus according to claim
2 1, further comprising having a function of preventing a blur of a still image, the apparatus
3 comprising:

4 a photoelectric transduction unit for photoelectrical-transducing incident light
5 from a lens;

6 a pulse generation unit for outputting a charge extract pulse for extracting charge
7 accumulated in the photoelectric transduction unit, and an erase pulse for erasing the

8 accumulated charge;

9 a diaphragm unit for controlling an amount of light incident on the photoelectric
10 transduction unit;

11 a diaphragm driving unit for controlling an open/close operation of the diaphragm
12 unit;

13 a control unit for outputting, to the diaphragm driving unit, a first control signal to
14 supply a driving voltage in a direction of opening the diaphragm unit, for outputting, to
15 the diaphragm driving unit, a second control signal to supply the driving voltage in a
16 direction of closing the diaphragm unit, and for controlling the operation of the
17 photoelectric transduction unit, the pulse generation unit, and the diaphragm driving unit;
18 and

19 a photographing mode switching unit for switching between a still image mode
20 and a motion picture mode, wherein the control unit outputs a control signal for supplying
21 the driving voltage for closing the diaphragm unit when the photographing mode
22 switching unit is switched to the still image mode.

1 11. (Currently Amended) ~~[[The]]~~ A photographing apparatus according to claim
2 1, further comprising: having a function of preventing a blur of a still image, the
3 apparatus comprising:

4 a photoelectric transduction unit for photoelectrical-transducing incident light
5 from a lens;

6 a pulse generation unit for outputting a charge extract pulse for extracting charge
7 accumulated in the photoelectric transduction unit, and an erase pulse for erasing the
8 accumulated charge;

9 a diaphragm unit for controlling an amount of light incident on the photoelectric
10 transduction unit;

11 a diaphragm driving unit for controlling an open/close operation of the diaphragm
12 unit;

13 a control unit for outputting, to the diaphragm driving unit, a first control signal to
14 supply a driving voltage in a direction of opening the diaphragm unit, for outputting, to
15 the diaphragm driving unit, a second control signal to supply the driving voltage in a
16 direction of closing the diaphragm unit, and for controlling the operation of the
17 photoelectric transduction unit, the pulse generation unit, and the diaphragm driving unit;

18 an electronic shutter unit for controlling an amount of the charge accumulated in
19 the photoelectric transduction unit by varying a potential barrier value of the
20 photoelectric transduction unit;

21 a lookup table unit for recording compensation values of an electronic shutter
22 speed corresponding to variations of the close time of the diaphragm unit on the basis of
23 the electronic shutter speed set up for a reference close time from an open state to a close
24 state of the diaphragm unit; and

25 a measuring unit for measuring the close time of the diaphragm unit, wherein the
26 control unit outputs to the electronic shutter unit a control signal for varying the

27 electronic shutter speed by as much as the compensation value recorded in the lookup
28 table unit according to a difference between the close time measured in the measuring
29 unit and the reference close time.

1 12. (Original) The apparatus according to claim 11, wherein the diaphragm
2 driving unit comprises:

3 a diaphragm motor for opening and closing the diaphragm unit by imparting a
4 rotational movement generated by a magnetic field to the diaphragm unit; and

5 a diaphragm motor driving unit for controlling a direction of rotation and a speed
6 of the diaphragm motor.

1 13. (Original) The apparatus according to claim 12, wherein the diaphragm
2 motor comprises:

3 a rotor connected to the diaphragm unit, and rotated in at least one of a forward
4 direction and a backward direction under control of the diaphragm motor driving unit;

5 an elastic member having one end connected to a fixed point and another end
6 connected to the rotor for rotating the rotor in a direction for closing the diaphragm unit;

7 a driving coil for generating a magnetic field to cause a rotational movement of the
8 rotor in at least one of a direction for opening and a direction for closing the diaphragm
9 unit; and

10 damping means, including a damping coil, a switch connected to said damping

11 coil, and a damping resistance connected to said switch, for preventing damping of the
12 rotor.

1 14. (Original) The apparatus according to claim 12, wherein the diaphragm
2 motor driving unit comprises:

3 an input voltage terminal unit having one end for receiving a reference potential
4 signal and another end for receiving a diaphragm control signal; and

5 a voltage conversion unit for converting an input voltage from the input voltage
6 terminal unit into a driving voltage of the diaphragm motor;

7 wherein the control unit outputs the first control signal for varying the diaphragm
8 control signal to form the driving voltage in the driving coil in a direction for closing the
9 diaphragm unit, and outputs the second control signal for opening the switch of the
10 damping means when closing the diaphragm unit.

1 15. (Original) The apparatus according to claim 14, wherein the varied
2 diaphragm control signal is supplied until the operation of extracting the charge
3 accumulated in the photoelectric transduction unit is completed according to the charge
4 extract pulse from the pulse generation unit.

1 16. (Original) The apparatus according to claim 14, wherein the varied
2 diaphragm control signal causes an initial value of the driving voltage to be higher than a

final value of the driving voltage for a predetermined period of time after a start time of the close operation of the diaphragm unit.

17. (Currently Amended) [[The]] A photographing apparatus according to claim 14, having a function of preventing a blur of a still image, the apparatus comprising:

a photoelectric transduction unit for photoelectrical-transducing incident light from a lens;

a pulse generation unit for outputting a charge extract pulse for extracting charge accumulated in the photoelectric transduction unit, and an erase pulse for erasing the accumulated charge;

a diaphragm unit for controlling an amount of light incident on the photoelectric transduction unit;

a diaphragm driving unit for controlling an open/close operation of the diaphragm unit; and

a control unit for outputting, to the diaphragm driving unit, a first control signal to supply a driving voltage in a direction of opening the diaphragm unit, for outputting, to the diaphragm driving unit, a second control signal to supply the driving voltage in a direction of closing the diaphragm unit, and for controlling the operation of the photoelectric transduction unit, the pulse generation unit, and the diaphragm driving unit;

wherein the diaphragm motor driving unit comprises:

an input voltage terminal unit having one end for receiving a reference

19 potential signal and another end for receiving a diaphragm control signal;

20 a voltage conversion unit for converting the input voltage from the input
21 voltage terminal unit into a driving voltage of the diaphragm unit; and

22 a switch unit for varying a voltage supplied from the voltage conversion
23 unit to the diaphragm motor according to a short operation, and for supplying the
24 driving voltage to the diaphragm motor to alternately open and close the
25 diaphragm unit;

26 wherein the control unit outputs a switching control signal to the switch unit,
27 thereby outputting a control signal for supplying to the diaphragm driving unit the
28 driving voltage for closing the diaphragm unit by inverting the driving voltage supplied
29 to the diaphragm motor in opening the diaphragm unit, and for outputting a control signal
30 for opening the switch connected to the damping coil when supplying the driving voltage
31 to close the diaphragm unit.

1 18. (Original) The apparatus according to claim 17, wherein the driving voltage
2 for closing the diaphragm unit is supplied until the operation of extracting the charge
3 accumulated in the photoelectric transduction unit is completed according to the charge
4 extract pulse from the pulse generation unit.

1 19. (Original) The apparatus according to claim 18, wherein the driving voltage
2 has an initial value higher than a final value, and is a step signal which maintains the

3 initial value for a predetermined period of time.

1 20. (Original) The apparatus according to claim 11, further comprising a
2 photographing mode switching unit for switching between a still image mode and a
3 motion picture mode, and wherein, when the photographing mode switching unit is set up
4 in the still image mode, the control unit outputs a control signal for supplying the driving
5 voltage for closing the diaphragm unit.

1 21. (New) A photographing apparatus having a function of preventing a blur of a
2 still image, the apparatus comprising:

3 a photoelectric transduction unit for photoelectrical-transducing incident light
4 from a lens;

5 a pulse generation unit for outputting a charge extract pulse for extracting charge
6 accumulated in the photoelectric transduction unit, and an erase pulse for erasing the
7 accumulated charge;

8 a diaphragm unit for controlling an amount of light incident on the photoelectric
9 transduction unit;

10 a diaphragm driving unit for controlling an open/close operation of the diaphragm
11 unit; and

12 a control unit for outputting, to the diaphragm driving unit, a first control signal to
13 supply a driving voltage in a direction of opening the diaphragm unit, for outputting, to

the diaphragm driving unit, a second control signal to supply the driving voltage in a direction of closing the diaphragm unit, and for controlling the operation of the photoelectric transduction unit, the pulse generation unit, and the diaphragm driving unit;

wherein the diaphragm driving unit comprises:

a diaphragm motor for opening and closing the diaphragm unit by imparting a rotational movement generated by a magnetic field to the diaphragm unit; and

a diaphragm motor driving unit for controlling a direction of rotation and a speed of the diaphragm motor;

wherein the a diaphragm motor driving unit comprises:

an input voltage terminal unit having one end for receiving a reference potential signal and another end for receiving a diaphragm control signal; and

a voltage conversion unit for converting an input voltage from the input voltage terminal unit into a driving voltage of the diaphragm motor; and

wherein the control unit outputs the first control signal for varying the diaphragm control signal to form the driving voltage in the driving coil in a direction for closing the diaphragm unit, and outputs the second control signal for opening the switch of the damping means when closing the diaphragm unit.

22. (New) The apparatus according to claim 21, wherein the varied diaphragm control signal is supplied until the operation of extracting the charge accumulated in the photoelectric transduction unit is completed according to the charge extract pulse from

4 the pulse generation unit.

1 23. (New) The apparatus according to claim 21, wherein the varied diaphragm
2 control signal causes an initial value of the driving voltage to be higher than a final value
3 of the driving voltage for a predetermined period of time after a start time of the close
4 operation of the diaphragm unit.